Lat 41.33192 Lon -121.64988

United States Department Of Agriculture | Forest Service | Shasta-Trinity National Forests

Reply To: 3420 Date: November 4, 1992

Subject: Increased white fir mortality, McCloud RD (Rept. No. N92-9)

To: Forest Supervisor, Shasta-Trinity NFs

Units of the Sandy Timber Sale are generally located within T40N, R3E. Units of the Hambone Timber Sale are generally located within T41N, R3E. Higher than anticipated white fir mortality began to appear in both sale areas during the early part of 1992. Mortality within the existing sales was recovered in salvage operations. Most of the 1992 white fir mortality could be attributed to attacks by the fir engraver, Scolytus ventalis, which occurred during a short period in the late summer of 1991. Trees continued to fade throughout the spring and summer, which required marking crews to return several times to identify the dead trees.

By early October of 1992, freshly faded white fir trees were becoming visible in the Sandy and Hambone Sale areas. The timing of fading was most evident in units which had been harvested only 6 to 8 weeks previously. The fresh mortality generally shows some signs of 1991 fir engraver attacks, however, extreme desiccation has evidently played a major role in the timing and amount of mortality. Numerous "green" white fir trees in the sale areas have white or buff colored boring dust accumulated in bark crevices as a result of 1992 fir engraver attacks. These trees are actually dead, but the foliage will not fade until the spring or summer of 1993.

The general location of the area of high mortality is shown on the enclosed isohyetal precipitation map. Normal precipitation for this area would be 25 to 30 inches per year. Precipitation measured at the McCloud Ranger Station over the past two years has been 52 to 59 percent of normal. If the reduction in precipitation was of the same magnitude in the Hambone area, it would have been below 20 inches per year for the past two years. Agriculture Handbook No. 271, Silvics of Forest Trees of the United States, states that the lower limit of precipitation for white fir is about 20 inches per year.

Tree species composition varies over the area which has high white fir mortality. Aggregations which have significant components of species other than white fir (ponderosa pine, sugar pine, incense-cedar, Douglas-fir), may still have a minimally stocked stand after most of the white fir is killed or harvested. Some aggregations which had a high (70% +) composition of white fir prior to mortality, already have spots of an acre, or more, which will have less than 10% crown closure once the foliage drops. The experience from the 1975 - 1977 drought was that high mortality of white fir continued for at least a year

following the return to normal precipitation. It would not be prudent to rely on any white fir larger than a sapling located in the high mortality area as a future crop tree for timber. The types of white fir trees which might be appropriate to leave include:

- Dead white fir for snags or coarse woody debris.
- Live white fir for snag or coarse woody debris recruitment.
- Live white fir less than 4 inches DBH which have no wounds on the bole, have a pointed top and have at least 70% live crown ratio.

An extended drought and extensive white fir mortality were not anticipated when the Sandy and Hambone sales were laid out. Mortality which has occurred during the past year will not allow some prescriptions to be implemented. Portions of some units planned for thinning, or partial retention, are rapidly becoming understocked. Other areas of the same sales which were planned to be clearcut have enough trees in the smaller size classes to be considered at least marginally stocked. If the purchaser were willing to swap some of the acres on which the prescriptions were to be implemented, the total result over the sale areas might be fairly close to the original intent of the projects.

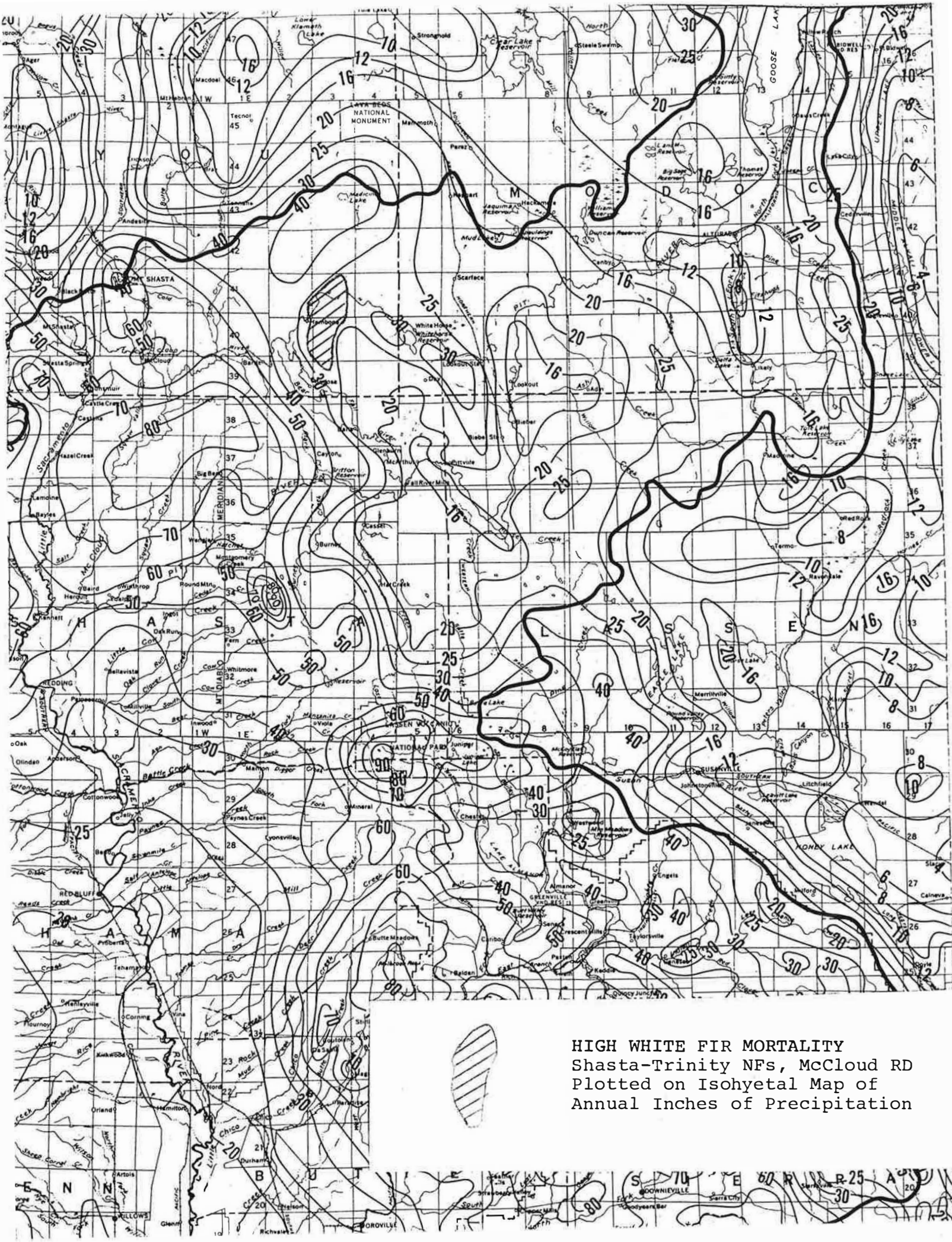
Planting will probably be necessary in some areas. Tree species characteristic of early seral stages, such as the pines and Douglas-fir, might be appropriate because they have had relatively low mortality in this area. Planting a mixture of species appropriate to the site tends to promote more stable future stands. Thinning may be planned for areas of advance regeneration. The primary advantage of thinning is to conserve moisture already in the soil. Thinning before soil moisture is available will not increase tree vigor. Some mortality has already occurred in the smaller size class trees. A reason to delay thinning until tree mortality returns to a more normal level would be to avoid cutting trees which may be needed at some point in the future.

If you need more information, please call Dave Schultz at (916) 246-5087.

David E. Schultz

DAVID E. SCHULTZ
Entomologist
FPM Northern CA Service Area

enclosure



HIGH WHITE FIR MORTALITY
Shasta-Trinity NFs, McCloud RD
Plotted on Isohyetal Map of
Annual Inches of Precipitation